

Impact of Counseling and Nutritional Support to Reduce Anemia among Adult Female - An Interventional Study Conducted in Urban Slums of Mumbai

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Abstract: Background: Anemia is one of the most widespread health conditions in India women of reproductive age. This situation is easily preventable by screening for Hemoglobin content in blood and providing nutritional supplement and counseling. Objective: To assess the impact of counseling and nutritional support to reduce anemia among adult females of Urban slum and resettlement areas of Mumbai City. Methodology: A Pre – Post interventional study was carried out in slum and resettlement colonies of M-East Ward, Mumbai. A validated questionnaire was used to collect information on socio-demographic characters. For interpretation of anemia, cut-off point for hemoglobin level was less than 12g/ dl. Of the 3004 women screened for anemia, 1473 women followed-up after 3 months. Result: Among 3004 women, 2683 were found to be anemic in age-group of 31-35 years (36.8%) followed by 21-25 years (22.6%). Of the 2683 women diagnosed as anemic as per W.H.O criteria, 50.1% suffered from moderate anemia; 39.69% from mild anemia and 8.6% from severe anemia. After intervention, 20% women showed improvement in Hemoglobin count. Conclusion: A model of continuous counseling and nutritional support may be helpful in alleviating complications arising due to anemia in women of reproductive age.

Keywords: Anemia, Nutritional Support, Adult Female, Urban Slum, Mumbai

1. Introduction

Anemia is a common nutritional deficiency disorder and global public health problem which affects both developing and developed countries with major consequences for human health and social and economic development [1]. Globally, two billion people are anemic, including 315 million in the South – East Asia Region (SEAR)[2]. Iron deficiency is the primary contributor to anemia and is the most widespread nutritional disorder. Other micronutrient deficiencies including folate and vitamin B12 also contribute to anemia. Recent evidence indicates a greater role for anemia of inflammation caused by parasitic infections including malaria [3]. Inherited disorders such as haemoglobinopathies also contribute to anemia[4]. In 2011, WHO estimated that in reproductive age, 191 million non-pregnant women and 11.5 million pregnant women in the SEAR are anemic[2]. The adverse effects of anemia, such as poor pregnancy outcomes, cognitive impairment and reduced work capacity impacts both health and economic development. In low – and middle – income countries, iron deficiency anemia is among the top 10 leading causes of years lost to disability and the 7th leading cause of years lost to disability in women [2]. In addition, WHO estimates that 12.8% of maternal deaths could be attributed to anemia.

Anemia in women and children is a moderate public health problem in some countries in the South – East Asia Region (Indonesia, Thailand, Sri Lanka and Democratic People's Republic of Korea), while others (India, Bangladesh, Nepal and Timor Leste) face a severe public health problem[5]. In socio-economically poor settings like resettlement colonies, slums and tribal areas, many females are married and bear a child by 18 years of age. Anemia in such women gives rise to complications during pregnancy as well as affecting the general fitness of both the mother and the child. The situation is further exacerbated by the unhealthy atmosphere and lifestyle of the people in slums and resettlement colonies. This situation is easily preventable by screening women for their Hemoglobin content in the blood and providing the nutritional supplement and counseling to them. In order to evaluate the existing conditions in slums and resettlement colonies of M-East ward, Mumbai, the current study was undertaken.

2. Objectives

To investigate the occurrence of anemia in women of the age of 18 years and above and to evaluate the improvement of their condition after nutritional counseling and supplement intervention

3. Materials and Methods

An Interventional based study was conducted among adult females of urban slum and resettlement area colonies of Mumbai City, Maharashtra, India. The study was carried out for duration of 6 months from April to September 2018. The study has inclusion criteria: a) the female greater than equal to 18 years of age group were included in the study b) the participants who have given the informed consent were enrolled in the . Exclusion criteria: a) the physically and mentally challenged female was not included in the study b) the participants who have not given the informed consent. Confidentiality of all participants was maintained and ethical guidelines for public health research were followed. The sample size of the study was found to be 3004 by taking the 95% confidence interval, precision 4% and power of the study 80%. This study uses the systematic random sampling were used in order to recruit the desired samples. A validated pre-designed pre-tested questionnaire was used to collect sociodemographic variables like age, marital status, family type and per-capita income. Other variables like medical history, menstrual history, dietary habits, tobacco consumption (smoked and smokeless) and knowledge regarding anemia were also collected. Three thousand and four participants underwent Complete Blood Count (CBC) testing to know the Hemoglobin levels. CBC was preferred over prick test due to higher accuracy achieved by CBC analyzer. For interpretation of anemia, cut-off point for hemoglobin level was less than 12g/dl. Data was collected by trained field investigators.

Intervention was imparted in three consecutive visits. During first pre-testing visit, nutritional counseling was given by the experts. During second visit, nutritional counseling with fortified flour with IEC material on recipes was provided to each participant. On the third visit, nutritional counseling with iron tablets to the anemic group was provided. After 3 months, only 1473 women were participated for anemia test, for these women hemoglobin examination was done again. Data was cleaned and analyzed using SPSS 20 version and appropriate statistical tools were applied. Descriptive statistics was calculated for socio-demographic variables and inferential statistics such as Paired Sample Test was used.

4. Results

A total of 3004 participants were screened for anemia in M-East ward, among which 2683 were anemic. Among them majority of participants were from age group of 31-35years (36.8%) followed by age group of 21-25 years (22.6%) show in Table 1

Table 1: Distribution of participants with respect to age group (N= 3004)

Age groups	No. of Participants	Percentage
15-20	511	17
21-25	677	22.6
26-30	666	22.2
31-35	1106	36.8
36+	44	1.4
Total	3004	100

Out of 3004 participants, 2414(80.4%) were married, 574(19.1%) single and 7(0.2%)separated. Of 3004

participants, 1177 (39.2%) participants stayed in a joint family, 1529(50.9%) in nuclear family and 292 (9.7%) in extended family. Socioeconomic Status was categorized by Kuppuswamy Class. One thousand eight hundred and sixty-nine (62.2%) participants reported per-capita income between 10000 to 15000 followed by 21.7% who were below 10000 (Table 2)

Table 2: Sociodemographic Profile of Participants (N=3004)

Variables	No. of Participants	Percentage	
No. of females in household	1	686	22.8
	2	1163	38.7
	3+	1155	38.4
Per Capita Income	<10000	653	21.7
	10000-15000	1869	62.2
	16000+	482	16
Marital Status	Married	2414	80.4
	Single	574	19.1
	Separated	7	0.2
	Divorce	0	0
	Missing	9	0.3
Type of family	Joint	1177	39.2
	Nuclear	1529	50.9
	Extended	292	9.7
	Missing	6	0.2

According to WHO Classification of Anemia, participants were classified. Majority (50.9%) suffered from Moderate Anemia followed by Mild Anemia (39.69%) and Severe Anemia (8.76%)

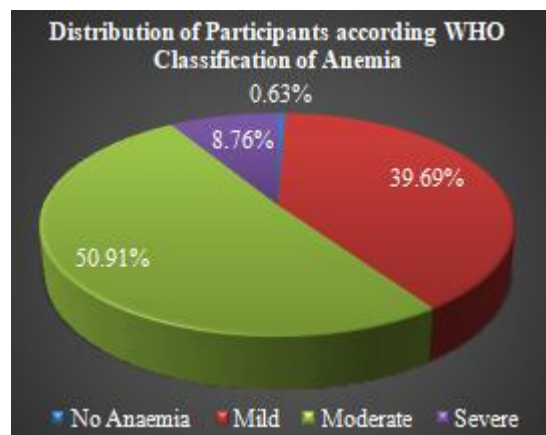


Figure 1: Distribution of participants according to WHO classification of Anemia. [< 8: Severe, 8-10.9: Moderate, 11-11.9: Mild, ≥12: No Anemia, Source: Hemoglobin concentration for the diagnosis of anemia and assessment of severity. WHO]

Out of 1473 Participants, 9.57% participant among age group 15-20 suffered from severe anemia before intervention. This was reduced to 4.79% after intervention. In 20-30 Age group, 49.7% were moderately anemic before and 44.2% were moderately anemic after intervention. Among 30-40 and 40+ Age group before intervention 39.3% and 38.4% were mildly anemic, after intervention it decreased to 32.2% and 23.0% respectively. It was observed that there was shift of participants from severe anemic to moderate and moderate anemic participants shifted to mild group and mild became normal (Table3).

Table 3: Prevalence of participants according to severity of Anemia Before and After the Interventions

Before Intervention				
Age groups	Severe Anaemia %	Moderate Anaemia %	Mild Anaemia %	No Anaemia %
15-20	9.57	55.32	34.57	0.53
20-30	7.59	49.17	42.57	0.66
30-40	10.84	49.70	39.31	0.15
40+	7.69	53.85	38.46	0.00
Overall	9.31	50.24	40.04	0.41
After Intervention				
15-20	4.79	43.62	31.38	20.21
20-30	4.62	44.22	33.50	17.66
30-40	4.52	44.28	32.23	18.98
40+	7.69	46.15	23.08	23.08
Overall	4.62	44.19	32.56	18.63

Table 3: it shows that before intervention 8.6% (severe anemic participant), 50% (moderate anemic), 41% (mild

anemic participant), 0% (normal) participants were having fatigue. After intervention it reduced to 3.2%, 42.1%, 29.8% among severe, moderate and mild anemic participant respectively. Similarly, with Morning sickness the drop from before intervention of 9.5%, 50.8% 39.3% and 0.3% among severe, moderate, mild and normal respectively to 4.3%, 47.5% 29.8% respectively after intervention. There has also been a change in the dietary intake of participants after the counseling.

Among the participants significant change has been seen related to the use of cloths during the menstruation and history of menorrhagia. Before intervention 13.6% (severe anemic group), 47% (mild anemic group) were using cloths during menstrual cycle. After intervention it reduced to 4.51% (severe anemic group), 32.7% (mild anemic group) (Table 4)

Table 4: Difference between Pre and Post Intervention Changes related to Menstrual hygiene and Menorrhagia

Characteristics	Interventions		Severe %	Moderate %	Mild %	No Anemia %	Total
Using of Cloths during period	Before Intervention	Yes	13.6	39.4	47.0	0.0	66
		No	9.1	50.7	39.8	0.4	1407
	After Intervention	Yes	6.1	36.4	30.3	27.3	66
		No	4.5	44.5	32.7	18.3	1407
Menorrhagia	Before Intervention	Yes	4.9	46.1	30.0	18.9	466
		No	4.5	43.2	33.8	18.6	1007
	After Intervention	Yes	12.4	50.2	37.1	0.2	466
		No	7.8	50.1	41.5	0.5	1007

Table 5: Distribution according to change in Hemoglobin Level Pre and Post Intervention

Paired Samples Statistics				
Difference between Pre and Post intervention	Mean	N	S.D	P-Value
Pre Intervention Hb Level	10.2869	1473	1.40758	
Post Intervention Hb Level	10.7487	1473	1.42888	< 0.05

At baseline the mean Hemoglobin level was 10.28 ± 1.40SD. After intervention there was an increase in Hemoglobin level to 10.74±1.42 SD.

5. Discussion

The current study reveals prevalence of anemia among women in reproductive age is 62% whereas as per the National Family Health Survey (2015–2016), a persistently high level of anemia among women in India (53%) is observed [6]. This is of great concern, and the 2017 National Health Policy tabled by the Ministry of Health and Family Welfare, Government of India, acknowledges this high burden [7]. Iron Deficiency Anemia (IDA) is a common problem among women, primarily due to malnourishment. Prevalence of anemia among women in this study is found to be higher as compared to other study as our study is based on women residing in slum area, and women belonging to low socioeconomic class [8].

Our study revealed that dietary habits are associated with anemia which is similar to study conducted in India by Deton and Dreze[9]. Women in India largely derive iron from non-heme sources, including grains, plants, cereals, lentils and vegetables; and, to a small extent, from iron

supplements, such as iron or iron and folic acid (IFA) tablets for pregnant women, and iron-fortified foods, as compared to sources of heme iron such as meat and fish, which have a higher rate of absorption [10, 11]. Thus, it is not surprising that India has the highest number of women with anemia globally, which increases the probability of maternal and child mortality and has significant economic implications for the nation's development [12]. This current study has number of strengths firstly; it uses the systematic random sampling for recruiting the participants due to which each and every sample population has an equal chance to fall in the study. Secondly, this study utilizes the human resources were well trained data collectors and doctors which increases the internal strength of the study. It is important to spread more awareness about healthy diet and routine health examination among the urban poor.

6. Conclusion

It was observed that most of the women were malnourished and were unaware about the cost-effective nutritious options available in the market. Also, they were skeptical about the blood withdrawal for the test. The present study concluded that an effective counseling and nutritional supplement can play a significant role in preventing nutritional deficiency like anemia. After the intervention significant growth in the knowledge has been seen. In present study an interval of 3 months was observed to be insufficient for improving the hemoglobin levels. A model of continuous counseling and nutritional support may be helpful in alleviating the complications arising due to anemia in women of reproductive age.

Conflict of interest: None

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